been added, and I have to thank Mr. Lemmon for *Aspidium Mohrioides* ; Dr. J. Schneck for *Aspidium Oreopteris*; J. Donnell Smith for a fine series of specimens of *Aspidium conterminum*, var *strigosum*; W. G. Wright and the Parish Bros. for additional and fine series of specimens of *Cheilanthes viscida.*

Notholaena Lemmoni has not yet been added to the Herbarium. *N. nivea* appears to have been collected nearly simultaneously in Arizona by Lemmon (vide June BULLETIN) and in New Mexico by Courtis. GEO. E. DAVENPORT.

§ 64. **Artificial Synopses.**—Since the adoption of the natural system of classification, recourse has been had to "artificial keys," to a greater or less extent, for the purpose of facilitating the determination of species. There is a tendency to overlook the natural relationship of plants, growing out of the use of these keys, which can only be avoided by a careful study of the principles of classification in general and its application to botany in the morphological and structural relations of the members of the vegetable kingdom.

A wrong impression is often tacitly conveyed to students just commencing the study, namely, that the chief end of the "analysis of plants" is to determine botanical names, when this is really a matter of convenience of secondary importance ; while the first object should be *the determination of the structural characteristics of the plant in hand*, which at once distinguish it from all others, and indicate its relation and position in the vegetable kingdom. If the more modern plan of imparting botanical instruction were rigidly carried out, namely, requiring the student to write *in accurate botanical language* the diagnostic characters of every plant studied in the preliminary course of instruction (say 50 or 75 plants), the number of those whose early habits of study will remain a stumbling-block in the further pursuit of botanical knowledge would be vastly decreased, and the number of those who become intensely enthusiastic in the science, and capable of thorough and systematic post-graduate study would receive a corresponding increase. To such, artificial keys are useful in economizing time, while the knowledge of structural relationship will not be concealed or overlooked in the abbreviated process.

A "manual" for beginners is useful in proportion as it is accurate and easy of application. Some of our botanical orders containing our most common plants are difficult for beginners chiefly for the reason that the generic and specific "synopses" of the text-books are founded on characters not readily determined, or are of themselves difficult of application, requiring a vast amount of searching to find the appropriate division. The following synopses may be found useful in the determination of species in a few of these difficult orders after the characters of the plants are carefully noted. I have found it convenient in studying the *Salicaceae* to mark those species whose catkins appear before the leaves, with numbers wired to the plant ; greater accuracy is thus insured and the variations in the same plant from year to year may be also studied with profit.

ARTIFICIAL SYNOPSIS OF THE UMBELLIFERAE.

A	Umbels simple or irregularly compound	B.
	Umbels regularly compound	D.
B	Leaves with no true blade	CRANTZIA.
	Leaves simple	C.
	Leaves 2–3 ternately divided	ERIGENIA.
C	Leaves linear or lanceolate	ERYNGIUM.
	Leaves orbicular or reniform	HYDROCOTYLE.
	Leaves palmately lobed or parted	SANICULA.
D	Flowers white or greenish	E.
	Flowers yellow or purple	Q.
E	With hollow petioles in place of leaves	TIEDEMANNIA.
	Leaves finely dissected	DISCOPLEURA.
	Leaves pinnately divided or compound	F.
	Leaves ternately divided or compound	I.
F	Involucre several leaved	G.
	Involucre almost wanting	H.
G	Carpels bristly	DAUCUS.
	Carpels five-ribbed, otherwise smooth,	SIUM.
H	Leaves simply-pinnate	ARCHEMORA.
	Leaves 2–3 pinnate	CONIOSELINUM.
I	Involucre almost wanting	J.
	Involucre more conspicuous	N.
J	Leaves trifoliate	CRYPTOTAENIA.
	Leaves 1–3 ternate	K.
	Leaves ternately decompound	CHAEROPHYLLUM.
K	Involucels bristly	EULOPHUS.
	Involucels few leaved	AETHUSA.
	Involucels many leaved	L.
L	Marginal flowers radiant	HERACLEUM.
	Flowers uniform	M.
M	Carpels with three slender ribs ; calyx obsolete	ANGELICA.
	Carpels with three stout ribs ; calyx teeth short	ARCHANGELICA
N	Leaves 2–3 ternate	O.
	Leaves decompound	CONIUM.
O	Carpels bristly	OSMORRHIZA.
	Carpels ribbed, not bristly	P.
P	Fruit elliptical ; involucels linear	LIGUSTICUM.
	Fruit subglobose ; involucels many leaved	CICUTA.
Q	Leaves simple, entire	BUPLEURUM
	Leaves pinnately divided or compound	R.
	Leaves ternately divided or compound	S.
R	Involucels bristly	POLYTAENIA.
	Involucels small or none	PASTINACA.
S	Leaflets entire	ZIZIA.
	Leaflets incised	THASPIUM.

[The caraway (*Carum carui*) is thoroughly naturalized in Central New York, and is even becoming a troublesome weed in some places. It is not in the Manual and so we suppose has here been omitted. One meeting with it would be brought to "H" of the synopsis.—EDS.]

Synopsis of the Northern Carices.

The numbers refer to the species described in Gray's Manual (edition and issue of 1868).

A	Spike solitary	B.
	Spikes two or more	E.
B	Spike dioecious	No. 1–2.
	Spike androgynous	C.
C	Spike staminate at summit	D.
	Spike staminate at base	Nos. 1, 2, 36, 138
D	Bracts and scales of fertile flowers leaf-like	No. –79.
	Bracts and scales never foliaceous	No. 3–6.
E	Stigmas 2	F.
	Stigmas 3	I.
F	Spikes dioecious	Nos. 11, 33.
	Spikes androgynous	G.
	Spikes monoecious	H.
G	Pistillate flowers below	No. 13–28.
	Pistillate flowers above	No. 29–45.
	Pistillate flowers variously situated	No. 10–12.
H	Staminate spike solitary	No. 65.
	Staminate spikes 1–3	No. 46–56.
I	Staminate spike solitary	J.
	Staminate spikes 2 or more	W.
J	Perigynia with merely a point without a beak	K.
	Perigynia with a distinct beak	N.
K	Perigynia smooth	L.
	Perigynia hairy	M.
L	Scales black, purple, or brown	No. 46–64.
	Scales brownish, tawny, or white	No. 65–81.
	Bracts green and foliaceous	No. 84–91.
	Bracts reduced to colored sheaths	No. 92–3.
M	Bracts narrow, foliaceous	No. 82–3.
	Bracts reduced to colored sheaths	No. 92–3.
N	Perigynia not at all or only slightly inflated	O.
	Perigynia moderately or much inflated	U.
O	Perigynia smooth	P.
	Perigynia hairy	S.
P	Beak entire	No. 102–3.
	Beak two-toothed	Q.
Q	Perigynia only slightly inflated	R.
	Perigynia moderately inflated	No. 120–7.
R	Perigynia few nerved or nerveless	No. 104–110.
	Perigynia nerved, tawny-yellow at maturity	No. 111–115.
S	Bracts short, leaves all radical	No. 94–101.
	Bracts leafy, long	T.
T	Perigynia slightly inflated	No. 102–3.
	Perigynia moderately inflated	No. 120–7.
U	Perigynia conspicuously nerved	V.
	Perigynia few nerved	No. 137–8.
V	Perigynia moderately inflated	No. 120–7.
	Perigynia much inflated	No. 128–36.

W	Perigynia not at all or only slightly inflated	X.
	Perigynia moderately inflated	No. 120–7.
	Perigynia much inflated	No. 139–151.
X	Perigynia with merely a short point	Y.
	Perigynia with a distinct beak	No. 116–19.
Y	Scales black, purple, or brown	No. 46–64.
	Scales brownish becoming white	No. 71.

SYNOPSIS OF THE NORTHERN SPECIES OF SALIX.

A	Catkins sessile appearing before the leaves	B.
	Catkins lateral with 4–5 leafy bracts at base	I.
	Cakins borne on the summit of lateral leafy shoots of the season	J.
B	Ovaries stalked	C.
	Ovaries sessile or nearly so	H.
C	Leaves entire or obscurely wavy toothed	D.
	Leaves serrate	F.
D	Leaves petioled	E.
	Leaves almost sessile; shrub 1°–1½° high	*S. tristis.*
E	Leaves taper-pointed; ovary densely wooly	*S. candida.*
	Leaves abrupt at apex; ovary silvery hairy	*S. humilis.*
F	Leaves smooth above	G.
	Leaves downy above; stigma sessile	*S. sericea.*
G	Leaves finely and evenly serrate	*S. petiolaris.*
	Leaves irregularly toothed, entire at base and apex	*S. discolor.*
H	Filaments united; leaves oblanceolate	*S. purpurea.*
	Filaments separate; leaves linear-lanceolate	*S. viminalis.*
I	Ovary smooth, lanceolate	*S. cordata.*
	Ovary silky hoary, almost linear	*S. livida* var. *occidentalis.*
	Ovary silky, ovoid conical	*S. chlorophylla.*
J	3° or less high	K.
	Trees; 12°–80° high	M.
K	Stem upright	*S. myrtilloides.*
	Prostrate or spreading; alpine species	L.
L	Ovary smooth, sessile	*S. herbacea.*
	Ovary smooth, short-stalked	*S. Cutleri.*
	Ovary silvery silky	*S. argyrocarpa.*
M	Stamens 3–6 or more; ovary stalked, glabrous	N.
	Stamens 2; ovary nearly sessile, glabrous	O.
	Stamens 2; ovary stalked, downy	*S. longifolia.*
N	Pods taper-pointed; stamens 5	*S. lucida.*
	Pods short ovate; stamens 3–6	*S. nigra.*
O	Leaves smooth, glaucous beneath	*S. fragilis.*
	Leaves silky beneath	*S. alba.*

LUCIEN M. UNDERWOOD.

§ 65. **Ophioglossum palmatum,** Plumier.—Truly, many and queer are Nature's freaks in shaping leaves, but I think she really surpasses herself in the odd forms she uses in the manufacture of *Ophioglossum palmatum.* Of about thirty specimens of this rare plant, which I received from the Indian River country last summer,